

Central Coast Regional Water Quality Control Board

Att: John Robertson, Executive Officer

The letter is to comment on changes proposed by the Central Coast Regional Water Quality Board in Ag Order 4.0. The primary goal of this letter is to point out that Ag Order 4.0 metrics as proposed would have a disproportionate negative impact on organic farming fertility programs. We propose some modifications to Ag Order 4.0 metrics to both meet the goals of the CCRWQB and allow organic farming to be sustainable on the Central Coast of California.

Organic farming is very successful in California. California now have over 1 million acres that are certified organic land. In 2016, California produced 38 percent of total U.S. farm commodity value, with \$2.9 billion in organic crops, poultry, livestock, and dairy products sold. Organic production is especially successful on the Central Coast where over 8% of Monterey County agricultural land is certified organic and even higher percentages in Santa Cruz and San Benito Counties. Indeed, over 30% of San Benito County's annual agricultural revenue comes from organically certified land.

I have been working in the organic leafy vegetable industry on the Central Coast of California for 19 years. I worked in organic pest and fertility management for Earthbound Farm and Mission Organics during this time. My last job was as Directors of agricultural research, pest management, and fertility management for the Internal Farming department at Earthbound Farm where I helped manage over 12,000 ac per year of organic leafy greens. I am currently working as a Research Agronomist for True Organic Products, which is the largest organic fertilizer company in the United States. My background experience has given me a good understanding of the substantial impact that the new rules in Ag Order 4.0 proposed could have on the organic leafy green industry on the Central Coast.

Problem:

- CCRQWCB state that growers report the total pounds of nitrogen applied (TNA). in fertilizer, soil amendments, and irrigation water. However, in contrast to conventional agriculture where 100% of total nitrogen applied will be in mineralized forms during cropping cycle (as NH_4 or NO_3), only a fraction of total nitrogen applied in organic fertilizer and organic amendments by organic growers is converted to mineralized nitrogen during the cropping cycle. Unlike conventional nitrogen fertilizer sources where nitrogen is soluble and in a mineralized form and readily available to crops, nitrogen in organic fertilizer is in crude proteins (and other biological molecules) and must be mineralized by the action of soil microbes before being available for crop uptake. Mineralization rates of organic amendments and fertilizers vary greatly but are generally below 60% in laboratory studies (see Table 1 for mineralization rates for common organic fertilizers).

Laboratory Incubations of Fertilizer Materials Percent N Mineralized

Material	2 weeks	4 weeks	8 weeks
2.5-2.0-2.5	4.0	5.8	13.6
4-4-2	28.8	30.5	37.5
8-5-1	47.2	43.5	58.5
10-5-2	43.8	49.3	58.8
12-0-0	48.7	56.5	59.3

Lab evaluations generally had lower levels of N mineralization and it may be because they don't have issues with loss of material from the pouches

Table 1 (From Richard Smith, UCCE, Monterey County)

Soil experts believe that nitrogen within organic soil amendments that is not mineralized within the cropping cycle is likely recalcitrant and adds to the organic nitrogen within the soil organic matter pool. Organic nitrogen within the organic matter pool is unlikely to leach nitrate nitrogen (Gaskell et al., UC ANR publication # 7249).

- If Ag Order 4.0 does not consider mineralization rates of organic fertilizers in their nitrogen applied metric, then organic growers would only be able to deliver 14-69% mineralized nitrogen (NH₄ & NO₃) to crops per pound of total nitrogen applied. This constraint on organic farming fertility programs could be very detrimental to organic farming on the Central Coast. If fertility rates are cut by 40%, organic crop yields and quality would be devastated, and organic farming may not be financially viable. Indeed, this may force some growers to go from organic production back to conventional production due to this Ag Order 4.0 constraint.
- Attributes of organic farming would contribute to the goals of Ag Order 4.0 and should be encouraged by CCRWQCB:
 - o Organic farming prohibits the use of synthetic pesticides. Therefore, organic production on the central coast would not be a source of pyrethroid or neonicotinoid pesticide run-off.
 - o Organic practices and organic amendments improve soil structure, improve water infiltration, promote the use of cover crop, and improve soil health – all factors that should reduce nutrient and sediment surface run-off.
 - o Organic amendments and fertilizers must be mineralized by soil microbial activity which improves soil organic matter and slowly release mineralized nitrogen. These attributes

reduce the risk of nitrate leaching into groundwater (Kramer et al. 2006, Aguilera et al. 2012).

- Proposed solution:

- We propose the following solution to eliminate the negative effect that Ag Order 4.0 would pose to organic farming: add a mineralization coefficient multiplied by the pounds of nitrogen applied for a specific organic fertilizer:
 - $M * A(\text{fer})$ = mineralization rate multiplied by the total nitrogen applied in fertilizer.
 - For each organic fertilizer, growers would use a scientifically measured mineralization rate (M) calculated by UC fertility specialists like those listed in Table 1.
- Encourage management practices that reduce residual nitrate remaining in the soil at the end of the growing season.
 - Winter cover cropping (October-March) can reduce nitrate leaching on average by 75% in lettuce production on the central coast (Smith et al. 2005). Encourage both organic and conventional growers to utilize more cover crop use by adding nitrogen removed from cover crops to R (amount of nitrogen removed).
 - An autumn application of high C:N ratio amendment (HCNA) has the potential to reduce nitrate leaching by immobilizing residual soil nitrate. Nitrate leaching during the winter following a broccoli crop can be reduced by as much as 72-98%, depending on rates and material applied (Muramoto et al. 2019). Encourage both organic and conventional growers to apply HCNA materials by adding nitrogen immobilized from applying HCNA materials to R (amount of nitrogen removed).
 - CCOF (California Certified Organic Farmers) would like to explore creating a water quality enhancement program that would supplement the existing organic certification and qualify an operation for the lowest tier of regulation. The certification would verify additional, quantifiable standards focused on nutrient management and erosion control. Inspectors would annually verify that the operation is following these standards and meeting water nutrient and sediment discharge goals. By empowering certifiers to oversee and verify that operations are using practices that protect water quality, Water Board staff time will be freed to work on other issues. We support CCOF to create a water quality enhancement program for organic growers.

Sincerely,

Ramy Colfer, Ph. D.

